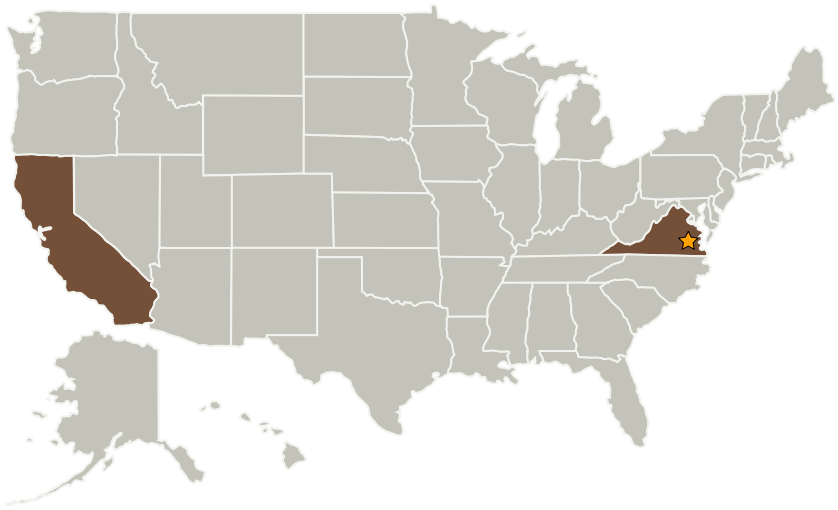
Cradle-to-Grave Monitoring of Composite Aircraft Structures, Phase I

Completed Technology Project (2007 - 2007)

Project Introduction

NextGen is proposing a simple yet powerful damage identification technique for advanced composite structures. We propose to develop a damage index based on vibration signature comparison with original signatures of the structure. Our approach is to autonomously perform damage detection as well as identification of non-service loading events by minimum number of sensors. We will start with the preliminary work done by Dr. Mal at UCLA and improve upon it to achieve the objective of cradle-to-grave degradation monitoring. The overall goal of the program is to develop an accurate, rapid, inexpensive method for detection of composite internal damage including bonds strength in built-up structures. The objective of the Phase I program is to develop and demonstrate that the proposed technique is accurate and reliable. We will achieve TRL of 2 in Phase I and subsequent technology transition to TRL of 4 in Phase II. NextGen's strength lies in related prior work, an in-depth understanding of damage modes in advanced composite structures, and comprehensive knowledge of damage detection techniques. Dr. Ajit Mal of the Mechanical Engineering Department at UCLA has an exceptional background in structural health monitoring built on decades of cutting edge research in NDE

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
NextGen Aeronautics, Inc.	Supporting Organization	Industry Minority-Owned Business, Small Disadvantaged Business (SDB)	Torrance, California

Primary U.S. Work Locations	
California	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX17 Guidance, Navigation, and Control (GN&C)
  - TX17.1 Guidance and Targeting Algorithms
    - TX17.1.1 Guidance Algorithms